METHOD AND APPARATUS FOR POWER-EFFICIENT HIGH-CAPACITY SCALABLE STORAGE SYSTEM

ABSTRACT OF THE DISCLOSURE

Systems and methods for providing scalable, reliable, power-efficient, high-capacity data storage, wherein large numbers of closely packed data drives having corresponding metadata and parity volumes are individually powered on and off, depending upon their respective usage. In one embodiment, the invention is implemented in a RAID-type data storage system which employs a large number of hard disk drives that are individually controlled, so that only the disk drives that are in use are powered on. The reduced power consumption allows the disk drives to be contained in a smaller enclosure than would conventionally be possible. In a preferred embodiment, the data protection scheme is designed to utilize large, contiguous blocks of space on the data disk drives, and to use the space on one data disk drive at a time, so that the data disk drives which are not in use can be powered down.